AW-CM276MA-SUR

IEEE 802.11a/b/g/n/ac Wireless LAN 2T2R and Bluetooth 5.0 Combo Module (M.2 2230)

Datasheet

Rev. A

DF

(For Standard)

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Features

WLAN

- PCIe M.2 TYPE 2230: 30mm(L) x 22mm(W) x 2.85 mm(H)(Max)
- SDIO interface support for WLAN
- Sub-meter accuracy WiFi indoor locationing(802.11mc)
- Multiple power saving modes for low power consumption
- IEEE 802.11i for advanced security
- Quality of Service (QoS) support for multimedia applications
- Support China WAPI
- Lead-free design

Bluetooth

- UART interface support for Bluetooth
- High speed UART,PCM interfaces
- Audio Codec interface support
- Bluetooth 5.0 complaint with Bluetooth 2.1 + Enhanced Data Rate (EDR)

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Revision History

Document NO: R2-2276MA-DST-04

Version	Revision Date	DCN NO.	Description	Initials	Approved
A	2021/03/15	DCN020904	● Initial Version(new format)	Renton Tao	NC Chen

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1. Introduction

1.1 Product Overview

AzureWave Technologies, Inc. introduces the IEEE 802.11ac/a/b/g/n 2X2 MU-MIMO WLAN & Bluetooth NGFF module --- **AW-CM276MA-SUR**. The module is targeted to mobile devices including **Notebook, TV, Tablet and Gaming Device** which need small package module, low power consumption, multiple interfaces and OS support. By using AW-CM276MA-SUR, the customers can easily enable the Wi-Fi, and BT embedded applications with the benefits of **high design flexibility, short development cycle, and quick time-to-market.**

Compliance with the IEEE 802.11ac/a/b/g/n standard supporting 802.11ac Wave 2, the AW-CM276MA-SUR uses Direct Sequence Spread Spectrum (**DSSS**), Orthogonal Frequency Division Multiplexing (**OFDM**), **DBPSK**, **DQPSK**, **CCK** and **QAM** baseband modulation technologies. A high level of integration and full implementation of the power management functions specified in the IEEE 802.11 standard minimize the system power requirements by using AW-CM276MA-SUR. In addition to the support of **WPA/WPA2/WPA3** and **WEP** 64-bit and 128-bit encryption, the AW-CM276MA-SUR also supports the **IEEE 802.11i** security standard through the implementation of **Advanced Encryption Standard** (**AES)/Counter Mode CBC-MAC Protocol (CCMP),** Wired Equivalent Privacy (**WEP)** with Temporal Key Integrity Protocol (**TKIP)**, Advanced Encryption Standard (**AES**)/Cipher-Based Message Authentication Code (**CMAC**), and WLAN Authentication and Privacy Infrastructure (**WAPI**) security mechanisms.

For the video, voice and multimedia applications the AW-CM276MA-SUR support **802.11e Quality of Service** (**QoS).** The device also supports **802.11h Dynamic Frequency Selection (DFS)** for detecting radar pulses when operating in the 5GHz range.

For Bluetooth operation, AW-CM276MA-SUR is **Bluetooth 5.0 (supports Low Energy).**

AW-CM276MA-SUR supports **SDIO** and high speed **UART interfaces** for WLAN and Bluetooth to the host processor.

AW-CM276MA-SUR is suitable for multiple mobile processors for different applications with the support cellular phone co-existence.

AW-CM276MA-SUR module adopts NXP's latest highly-integrated dual-band WLAN & Bluetooth SoC---**88W8997**. All the other components are implemented by all means to reach the mechanical specification required.

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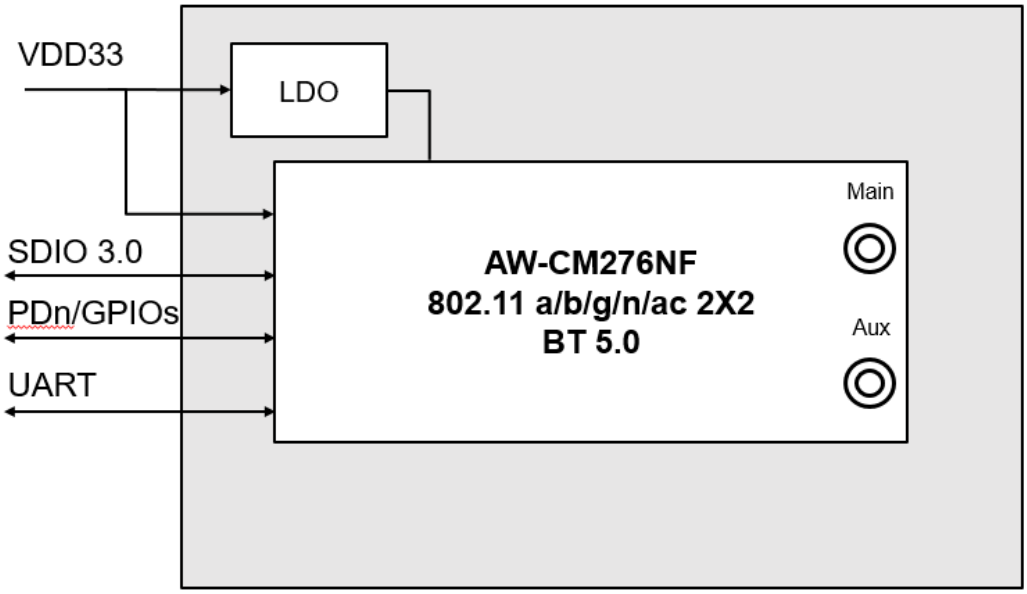
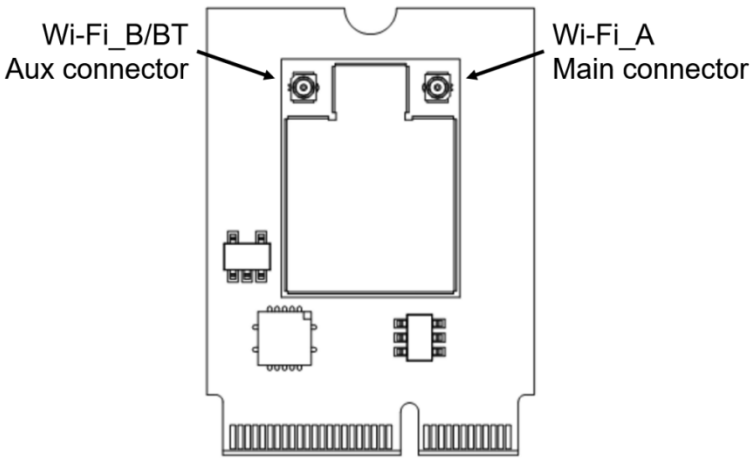
1.2 Block Diagram

AW-CM276MA-SUR NGFF Module





Module antenna configuration

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1.3 Specifications Table

1.3.1 General

Features	Description
Product Description	Wireless LAN 2T2R & Bluetooth Combo M.2 Module
Major Chipset	NXP 88W8997
Host Interface	SDIO for WLAN,UART for Bluetooth
Dimension	22mm(W) x 30mm(L) x 2.85mm(H) (Tolerance remarked in mechanical drawing)
Form factor	M.2 2230
Antenna	I-PEX MHF4 Connector Receptacle (20449) ANTA(Main)：WiFi → TX/RX ANTB(Aux)：WiFi/Bluetooth → TX/RX
Weight	0.5 g

1.3.2 WLAN

Features	Description
WLAN Standard	IEEE 802.11 a/b/g/n/ac
Frequency Rage	2.4 GHz：2.412 ~ 2.484 GHz 5 GHz：4.915 ~5.925GHz
Modulation	DSSS, OFDM, DBPSK, DQPSK, CCK, 16-QAM, 64-QAM, 256-QAM
Number of Channels	**2.4GHz** ■ USA, NORTH AMERICA, Canada and Taiwan – 1 ~ 11 ■ China, Australia, Most European Countries, Japan – 1 ~ 13 **5GHz** ■ USA, EUROPE –36,40,44,48,52,56,60,64,100,104,108,112,116,120, 124,128,132,136,140,149,153,157,161,165

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Output Power

2.4GHz

	Min	Typ	Max	Unit
11b (11Mbps) @EVM<35%	15.5	17	18.5	dBm
11g (54Mbps) @EVM≦-27 dB	14.5	16	17.5	dBm
11n (HT20 MCS7) @EVM≦-28 dB	14.5	16	17.5	dBm
11n (HT40 MCS7) @EVM≦-28 dB	12.5	14	15.5	dBm

5GHz

	Min	Typ	Max	Unit
11a (54Mbps) @EVM≦-27 dB	11	13	15	dBm
11n (HT20 MCS7) @EVM≦-28 dB	11	13	15	dBm
11n (HT40 MCS7) @EVM≦-28 dB	10	12	14	dBm
11ac (VHT20 MCS8) @EVM≦-30 dB	11	13	15	dBm
11ac (VHT40 MCS9) @EVM≦-32 dB	10	12	14	dBm
11ac (VHT80 MCS9) @EVM≦-32 dB	8	10	12	dBm

Receiver Sensitivity

2.4GHz

	Min	Typ	Max	Unit
11b (11Mbps)	-	-88	-85	dBm
11g (54Mbps)	-	-75	-72	dBm
11n (HT20 MCS7)	-	-72	-70	dBm
11n (HT40 MCS7)	-	-69	-67	dBm

5GHz

	Min	Typ	Max	Unit
11a (54Mbps)	-	-72	-68	dBm
11n (HT20 MCS7)	-	-70	-67	dBm
11n (HT40 MCS7)	-	-68	-65	dBm
11ac(VHT20 MCS8)	-	-65	-62	dBm
11ac(VHT40 MCS9)	-	-63	-60	dBm
11ac(VHT80 MCS9)	-	-60	-57	dBm

Data Rate

- 802.11b: 1, 2, 5.5, 11Mbps
- 802.11a/g: 6, 9, 12, 18, 24, 36, 48, 54Mbps
- 802.11n: up to 150Mbps-single

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	■ 802.11n: up to 300Mbps-2x2 MIMO ■ 802.11ac:up to 192.6Mbps (20MHz channel) ■ 802.11ac:up to 400Mbps (40MHz channel) 802.11ac:up to 866.7Mbps (80MHz channel)
Security	■ WAPI ■ WEP 64-bit and 128-bit encryption with H/W TKIP processing ■ WPA/WPA2/WPA3 (Wi-Fi Protected Access) AES-CCMP hardware implementation as part of 802.11i security standard

* If you have any certification questions about output power please contact FAE directly.

1.3.3 Bluetooth

<table>
<tr><th>Features</th><th>Description</th></tr>
<tr><td>Bluetooth Standard</td><td>Bluetooth 2.1 and 3.0+Enhanced Data Rate (EDR) + BT 5.0</td></tr>
<tr><td>Bluetooth VID/PID</td><td>1286/204E</td></tr>
<tr><td>Frequency Rage</td><td>2402~2480MHz</td></tr>
<tr><td>Modulation</td><td>GFSK (1Mbps), Π/4 DQPSK (2Mbps) and 8DPSK (3Mbps)</td></tr>
<tr><td>Output Power</td><td>
<table>
<tr><td></td><td>Min</td><td>Typ</td><td>Max</td><td>Unit</td></tr>
<tr><td>BDR</td><td>0</td><td>2</td><td>4</td><td>dBm</td></tr>
<tr><td>EDR</td><td>0</td><td>2</td><td>4</td><td>dBm</td></tr>
<tr><td>BLE</td><td>0</td><td>2</td><td>4</td><td>dBm</td></tr>
</table>
</td></tr>
<tr><td>Receiver Sensitivity</td><td>BER < 0.1%
<table>
<tr><td></td><td>Min</td><td>Typ</td><td>Max</td><td>Unit</td></tr>
<tr><td>BDR</td><td></td><td>-83</td><td></td><td>dBm</td></tr>
</table>
</td></tr>
</table>

1.3.4 Operating Conditions

Features	Description
Operating Conditions	
Voltage	Power supply for host:3.3V

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Operating Temperature	-30~85 ℃
Operating Humidity	less than 85% R.H.
Storage Temperature	-40~125 ℃
Storage Humidity	less than 60% R.H.
ESD Protection	
Human Body Model	+-2kV
Changed Device Model	+-500V

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2. Pin Definition

2.1 Pin Table

Pin No	Definition	Basic Description	Voltage	Type
1	GND	Ground	GND	
2	3.3V	3.3V power supply.	Power	3.3V
3	NC	No connect to anything	Floating	
4	3.3V	3.3V power supply	Power	3.3V
5	NC	No connect to anything	Floating	
6	LED_WLAN_L	Active low signal. The signal is used to provide status indicators via LED. (in this project is not used, please let it open)	Floating	1.8V
7	GND	Ground	GND	
8	PCM_CLK	PCM clock	I/O	1.8V
9	SD_CLK	SDIO Clock input	1.8V	I
10	PCM_SYNC	PCM Synchronization control	O	1.8V
11	SD_CMD	SDIO Command/response (input/output)	1.8V	I/O
12	PCM_OUT	PCM data Out	O	1.8V
13	SD_DAT[0]	SDIO Data line Bit[0]	1.8V	I/O
14	PCM_IN	PCM data Input	I	1.8V
15	SD_DAT[1]	SDIO Data line Bit[1]	1.8V	I/O
16	LED_BT_L	Active low signal. The signal is used to provide status indicators via LED. (in this project is not used, please let it open)	Floating	1.8V
17	SD_DAT[2]	SDIO Data line Bit[2]	1.8V	I/O
18	GND	Ground.	GND	
19	SD_DAT[3]	SDIO Data line Bit[3]	1.8V	I/O
20	GPIO[13]/BT IRQ	GPIO[13]/ BT Wake Host(active low)	O	3.3V
21	SDIO WAKE#	WLAN WAKE HOST	1.8V	I
22	GPIO[8] / UART_SOUT	GPIO[8] / UART_SOUT (output)	O	1.8V
23	SDIO RESET#	WLAN independent reset	1.8V	I
32	GPIO[9] / UART_SIN	GPIO[9] / UART_SIN (input)	I	1.8V
33	GND	Ground.	GND	
34	GPIO[11] / UART_RTSn	GPIO[11] / UART_RTSn (output)	O	1.8V
35	NC	No connect to anything	Floating	
36	GPIO[10] / UART_CTSn	GPIO[10 / UART_CTSn] (input)	I	1.8V
37	NC	No connect to anything	Floating	
38	JTAG_TDO	JTAG_TDO/GPIO[17]	Floating	
39	GND	Ground	GND	
40	DEV_WLAN_WAK	DEV_WLAN_WAKE/GPIO[15]	Floating	

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	E			
41	NC	No connect to anything	Floating	
42	DEV_BT_WAKE	DEV_WLAN_WAKE/GPIO[12]	Floating	
43	NC	No connect to anything	Floating	
44	JTAG_TDI	JTAG_TDI/GPIO[16]	Floating	
45	GND	Ground	GND	
46	JTAG_TCK	JTAG_TCK/GPIO[14]	Floating	
47	NC	No connect to anything	Floating	
48	JTAG_TMS	JTAG_TMS/GPIO[15]	Floating	
49	NC	No connect to anything	Floating	
50	CLK_32KHz	External sleep clock input (32.768 kHz).	I	3.3V
51	GND	Ground	GND	
52	NC	No connect to anything	Floating	
53	NC	No connect to anything	Floating	
54	NC	No connect to anything	Floating	
55	NC	No connect to anything	Floating	
56	PDn	Full Power-Down (input) (active low) The module internal pull-up 51kΩ on this pin.	I	3.3V
57	GND	Ground	GND	
58	NC	No connect to anything	Floating	
59	NC	No connect to anything	Floating	
60	NC	No connect to anything	Floating	
61	NC	No connect to anything	Floating	
62	NC	No connect to anything	Floating	
63	GND	Ground	GND	
64	NC	No connect to anything	Floating	
65	NC	No connect to anything	Floating	
66	NC	No connect to anything	Floating	
67	NC	No connect to anything	Floating	
68	NC	No connect to anything	Floating	
69	GND	Ground	GND	
70	NC	No connect to anything	Floating	
71	NC	No connect to anything	Floating	
72	3.3V	3.3V power supply	Power	
73	NC	No connect to anything	Floating	
74	3.3V	3.3V power supply	Power	
75	GND	Ground	GND	

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3. Electrical Characteristics

3.1 Absolute Maximum Ratings

Symbol	Parameter	Minimum	Typical	Maximum	Unit
3V3	DC supply for the 3.3V input	-	3.3	3.63	V
VIO	I/O power supply	-	1.8 2.5 3.3	2.2 3.0 4.0	V
Tstorage	Storage Temperature	-40	-	125	℃

3.2 Recommended Operating Conditions

Symbol	Parameter	Minimum	Typical	Maximum	Unit
3V3	DC supply for the 3.3V input	2.97	3.3	3.63	V
VIO	I/O power supply	1.62 2.25 2.97	1.8 2.5 3.3	1.98 2.75 3.63	V
T_A	Ambient operating temperature	-30	-	85	℃

3.3 Digital IO Pin DC Characteristics

3.3.1 DC Electricals-1.8V Operation(VIO)

Symbol	Parameter	Minimum	Typical	Maximum	Unit
VIL	Input low voltage	-0.4	-	0.3*V18	V
VIH	Input high voltage	0.7*V18	-	V18+0.4	V
V_{HYS}	Input hysteresis	100	-	-	mV
VOL	Output low voltage	-	-	0.4	V
VOH	Output high voltage	V18-0.4	-	-	V

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3.3.2 DC Electricals-3.3V Operation(VIO)

Symbol	Parameter	Minimum	Typical	Maximum	Unit
VIL	Input low voltage	-0.4	-	0.3*V33	V
VIH	Input high voltage	0.7*V33	-	V33+0.4	V
V_{HYS}	Input hysteresis	100	-	-	mV
VOL	Output low voltage	-	-	0.4	V
VOH	Output high voltage	V33-0.4	-	-	V

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3.4 Host Interface

3.4.1 SDIO Interface

The AW-CM276MA-SUR supports a SDIO device interface that conforms to the industry SDIO Full-Speed card specification and allows a host controller using the SDIO bus protocol to access the Wireless SoC device.

The AW-CM276MA-SUR acts as the device on the SDIO bus. The host unit can access registers of the SDIO interface directly and can access shared memory in the frvice through the use of BARs and a DMA engine.

- Support SDIO 3.0 Standard.
- On-chip memory used for CIS.
- Supports 4-bit SDIO and 1-bit SDIO transfer modes.
- Special interrupt register for information exchange.
- Allows card to interrupt host.

SDIO Interface Signals

AW-CM276MA-SUR SDIO Pin Name	Type	Description
SDIO_DATA_CLK	I	SDIO 4-bit mode: Clock SDIO 1-bit mode: Clock
SDIO_DATA_CMD	I/O	SDIO 4-bit mode: Command line SDIO 1-bit mode: Command line
SDIO_DATA_3	I/O	SDIO 4-bit mode: Data line Bit[3] SDIO 1-bit mode: Not used
SDIO_DATA_2	I/O	SDIO 4-bit mode: Data line Bit[2] or Read Wait (optional) SDIO 1-bit mode: Read Wait (optional)
SDIO_DATA_1	I/O	SDIO 4-bit mode: Data line Bit[1] SDIO 1-bit mode: Interrupt
SDIO_DATA_0	I/O	SDIO 4-bit mode: Data line Bit[0] SDIO 1-bit mode: Data line

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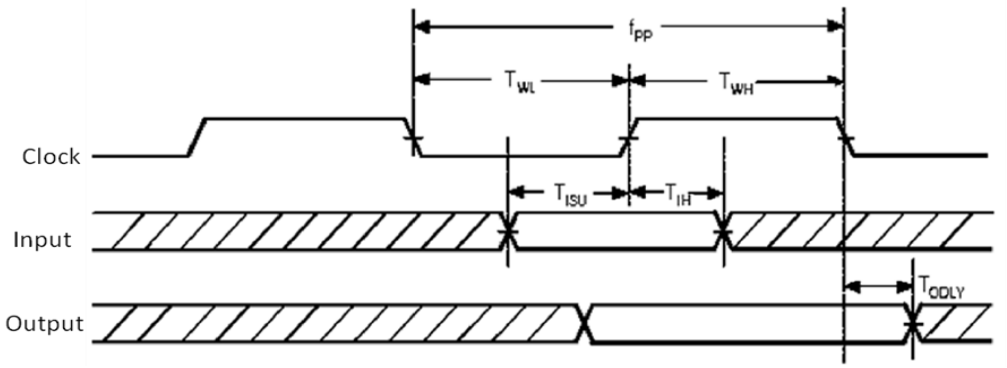
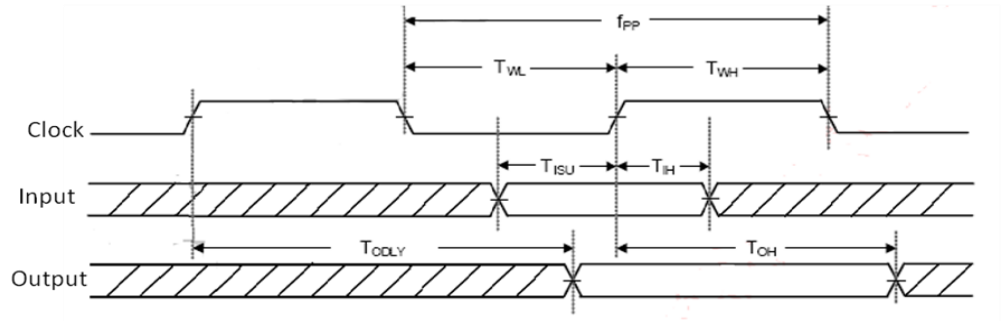
3.4.2 SDIO Protocol Timing

3.4.2.1 Default Speed, High-Speed Modes (3.3V)



SDIO protocol timing Diagram - Default mode. (3.3V)



SDIO protocol timing Diagram - High Speed mode. (3.3V)

Symbol	Parameter	Condition	Min	Typ	Max	Units
fpp	CLK Frequency	Normal	0	--	25	MHz
		High Speed	0	--	50	MHz
T_{WH}	CLK High Time	Normal	10	--	--	ns
		High Speed	7	--	--	ns
T_{WL}	CLK Low Time	Normal	10	--	--	ns
		High Speed	7	--	--	ns
T_{ISU}	Input Setup Time	Normal	5	--	--	ns
		High Speed	6	--	--	ns
T_{IH}	Input Hold Time	Normal	5	--	--	ns
		High Speed	2	--	--	ns
T_{ODLY}	Output Delay Time	Normal	--	--	14	ns
	CL ≦ 40pF (1 card)	High Speed	--	--	14	ns
T_{OH}	Output Hold Time	High Speed	2.5	--	--	ns

SDIO Timing Data – Default Speed / High-Speed modes. (3.3V)

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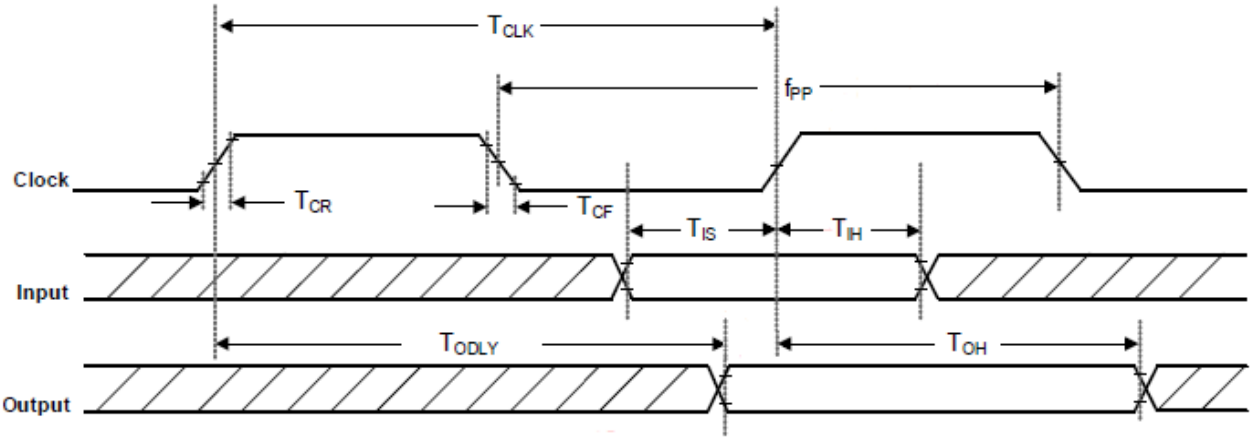
3.4.2.2 SDR12, SDR25, SDR50 Modes (up to 100MHz) (1.8V)



SDIO Protocol Timing Diagram - SDR12, SDR25, SDR50 Modes (up to 100 MHz)(1.8V)

Symbol	Parameter	Condition	Min	Typ	Max	Units
F_{pp}	CLK Frequency	SDR12/25/50	25	-	100	MHz
T_{CLK}	Clock Time	SDR12/25/50	10	-	40	ns
T_{IS}	Input Setup Time	SDR12/25/50	3	-	-	ns
T_{IH}	Input Hold Time	SDR12/25/50	0.8	-	-	ns
T_{CR} ,T_{CF}	Rise time, fail time TCR ,TCF <2ns(max) at 100MHz CCARD =10pF	SDR12/25/50	-	-	0.2*T_{CLK}	ns
T_{ODLY}	Output Delay Time CL ≦ 30pF	SDR12/25/50	-	-	7.5	ns
T_{OH}	Output Hold Time CL =15pF	SDR12/25/50	1.5	-	-	ns

SDIO Timing Data - SDR12/25/50 modes. (1.8V)

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3.4.2.3 SDR104 Mode (208MHz) (1.8V)

SDIO Protocol Timing Diagram –SDR104 Mode (208MHz)

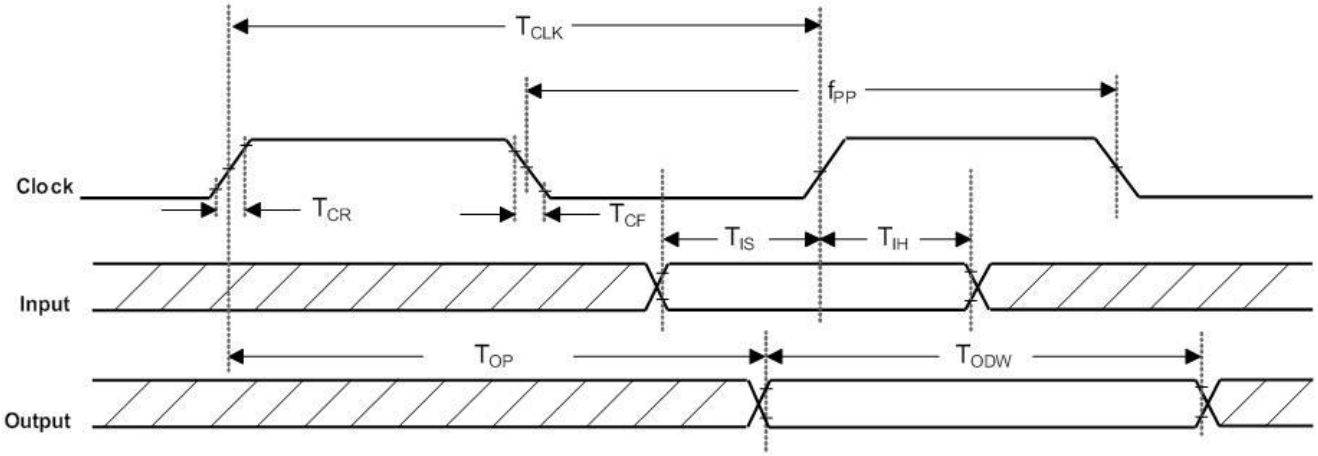

Table shows SDIO Timing Data—SDR104 Mode (208MHz)

Symbol	Parameter	Condition	Min	Typ	Max	Units
f_{pp}	CLK Frequency	SDR104	0	-	208	MHz
T_{CLK}	Clock Time	SDR104	4.8	-	-	ns
T_{IS}	Input Setup Time	SDR104	1.4	-	-	ns
T_{IH}	Input Hold Time	SDR104	0.8	-	-	ns
T_{CR} ,T_{CF}	Rise time, fail time T_{CR} ,T_{CF} <0.96ns(max) at 208MHz C_{CARD}=10pF	SDR104	-	-	0.2*T_{CLK}	ns
T_{OP}	Card output phase	SDR104	0	-	10	ns
T_{ODW}	Output timing of variable data window	SDR104	2.88	-	-	ns

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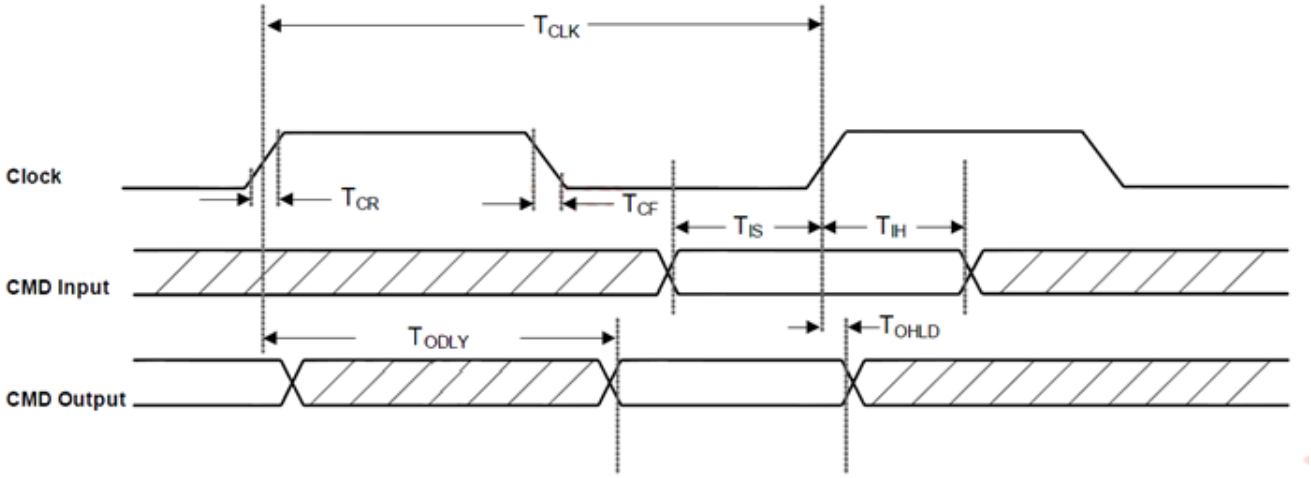
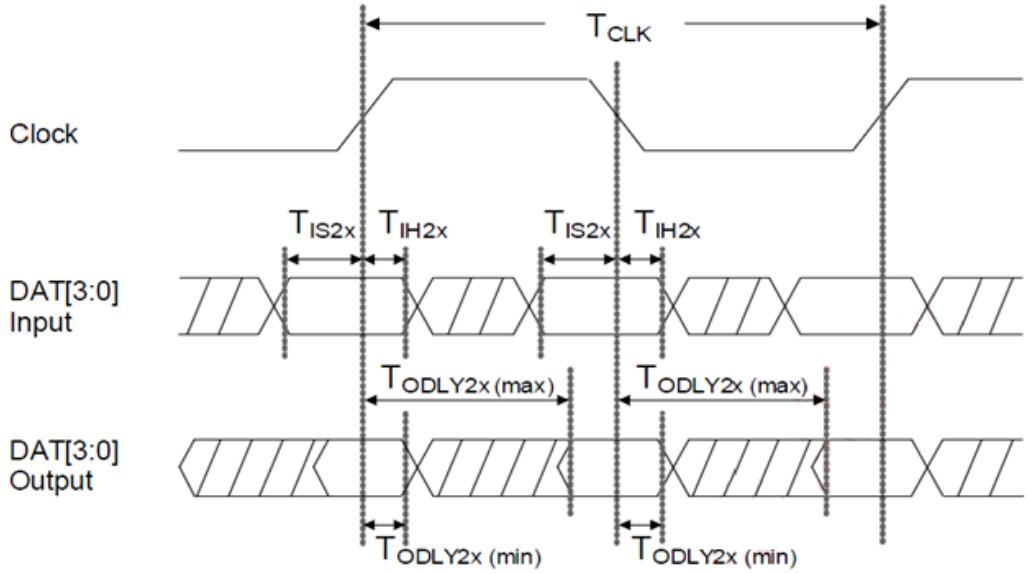
3.4.2.4 DDR50 Mode (50MHz) (1.8V)



SDIO CMD Timing Diagram - DDR50 Mode (50 MHz)



SDIO DAT[3:0] Timing Diagram - DDR50 Mode[1] (50 MHz)

[1] In DDR50 mode, DAT[3:0] lines are sampled on both edges of the clock (not applicable for CMD line).

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Symbol	Parameter	Condition	Min	Typ	Max	Units
Clock						
T_{CLK}	Clock time	DDR50	20	-	-	ns
T_{CR}, T_{CF}	Rise time, fall time	DDR50	-	-	0.2*T_{CLK}	Ns
Clock Duty		DDR50	45	-	55	%
CMD Input						
T_{IS}	Input setup time	DDR50	6	-	-	ns
T_{IH}	Input hold time	DDR50	0.8	-	-	ns
CMD Output						
T_{ODLY}	Output delay time during data transfer mode	DDR50	-	-	13.7	ns
T_{OHLD}	Output hold time	DDR50	1.5	-	-	ns
DAT [3:0] Input						
T_{IS2X}	Input setup time	DDR50	3	-	-	ns
T_{IH2X}	Input hold time	DDR50	0.8	-	-	ns
DAT [3:0] Output						
$T_{ODLY2X(max)}$	Output delay time during data transfer mode	DDR50	-	-	7	ns
$T_{ODLY2X(min)}$	Output hold time	DDR50	1.5	-	-	ns

SDIO Timing Data - DDR50 Mode (50MHz)

3.4.2 High-Speed UART Interface

The AW-CM276MA-SUR supports a high-speed Universal Asynchronous Receiver/Transmitter (UART) interface, compliant to the industry standard 16550 specification. High-speed baud rates are supported to provide the physical transport between the device and the host for exchanging Bluetooth data. Table shows the rates supported.

The UART interface features include:

FIFO mode permanently selected for transmit and receive operations

Two pins for transmit and receive operations

Two flow control pins

Interrupt triggers for low-power, high throughput operation

The UART interface operation includes:

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Upload boot code to the internal CPU (for debug purposes)

Support diagnostic tests

Support data input/output operations for peripheral devices connected through a standard UART interface

UART Baud Rates Supported

Baud Rate				
1200	38400	460800	1500000	3000000
2400	57600	500000	1843200	3250000
4800	76800	921600	2000000	3692300
9600	115200	1000000	2100000	4000000
19200	230400	1382400	2764800	--

3.4.2.1 UART Interface Signal Description

Table shows the standard UART signal names on the device.

Signal Name	16550 Standard Pin Name	Description
Data Bus		
UART_SIN	SIN	Serial data input from modem, data set, or peripheral device
UART_SOUT	SOUT	Serial data output from modem, data set, or peripheral device
Modem Control		
UART_RTSN	RTS	Request To Send output to modem, data set, or peripheral device (active low)
UART_CTSN	CTS	Clear To Send input from modem, data set, or peripheral device (active low)

3.4.2.2 UART Interface Functional Description

3.4.2.2.1 Booting from UART

When booting from the UART, the AW-CM276MA-SUR device has the following requirements:

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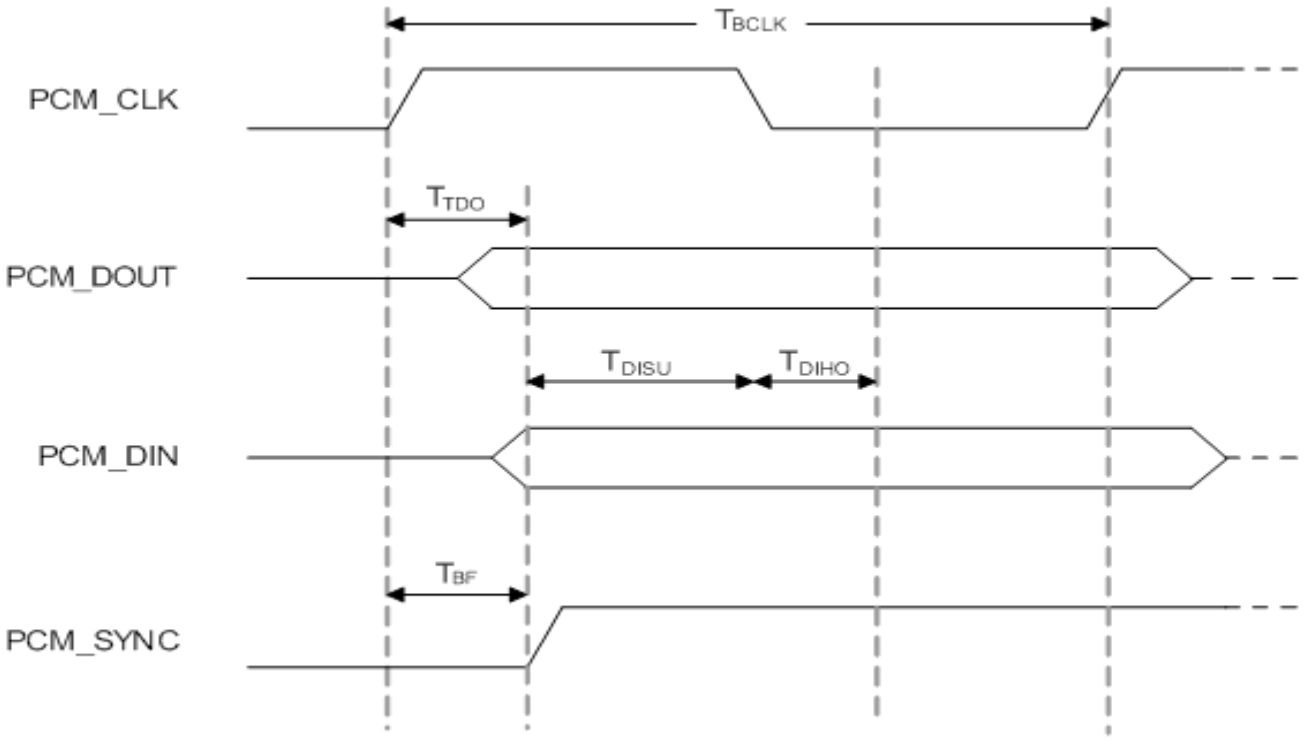
System Requirement	Description
Number of data bits	8 bits
Stop bits	1 bit
Parity	No parity
Baud Rate	115200

3.4.4.2.2 UART as Test Port

Test diagnostic programs may be uploaded to the CPU through the UART interface. During execution, the diagnostic program transmits performance and status information through the UART by performing a write to the PBU address space designated to the UART.

3.4.3 PCM Interface

3.4.3.1 PCM Timing Specification – Master Mode



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Symbol	Parameter	Condition	Min	Typ	Max	Units
F_{BCLK}	--	--	--	2/2.048	--	MHz
Duty $Cycle_{BCLK}$	--	--	0.4	0.5	0.6	--
$T_{BCLK\ rise/fall}$	--	--	--	3	--	ns
T_{DO}	--	--	--	--	15	ns
T_{DISU}	--	--	20	--	--	ns
T_{DIHO}	--	--	15	--	--	ns
T_{BF}	--	--	--	--	15	ns

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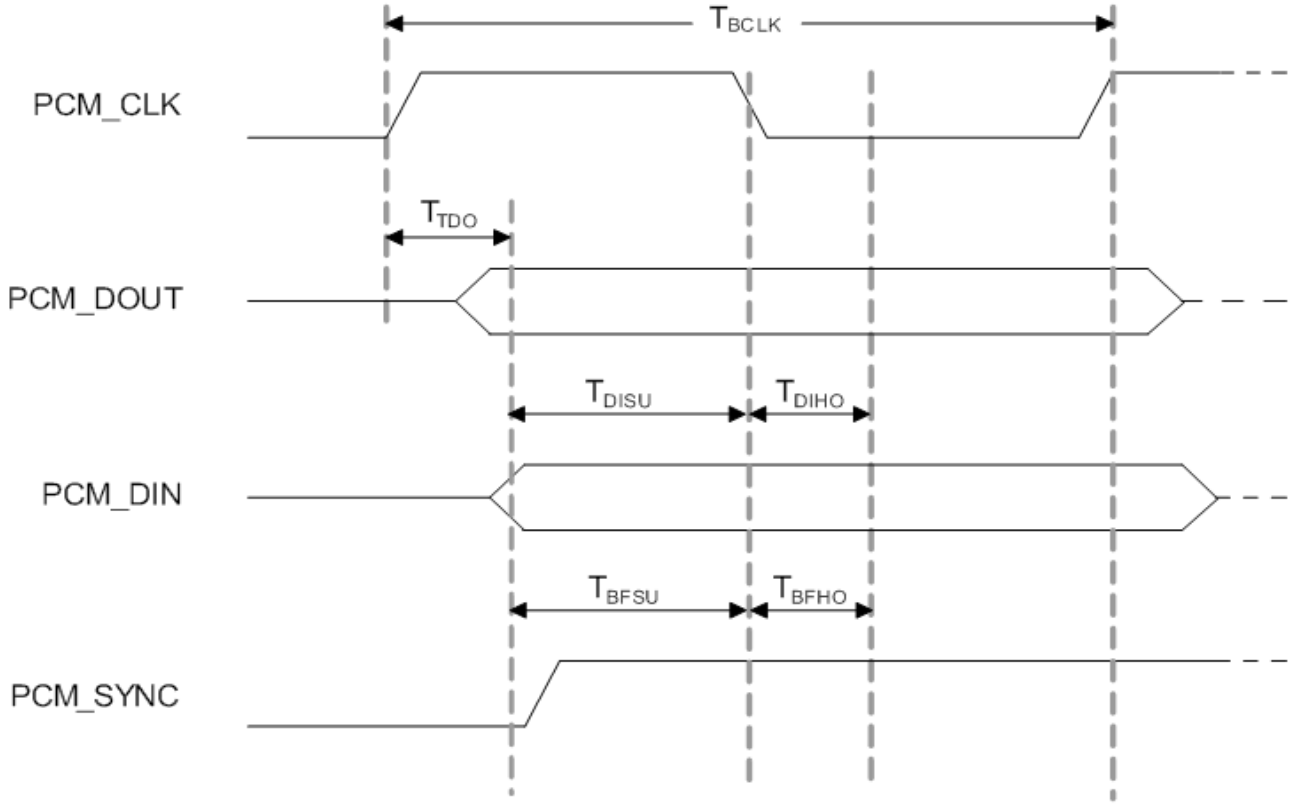
3.4.3.2 PCM Timing Specification – Slave Mode



Symbol	Parameter	Condition	Min	Typ	Max	Units
F_{BCLK}	--	--	--	2/2.048	--	MHz
Duty $Cycle_{BCLK}$	--	--	0.4	0.5	0.6	--
$T_{BCLK\ rise/fall}$	--	--	--	3	--	ns
T_{DO}	--	--	--	--	30	ns
T_{DISU}	--	--	15	--	--	ns
T_{DIHO}	--	--	10	--	--	ns
T_{BFSU}	--	--	15	--	--	ns
T_{BFHO}	--	--	10	--	--	ns

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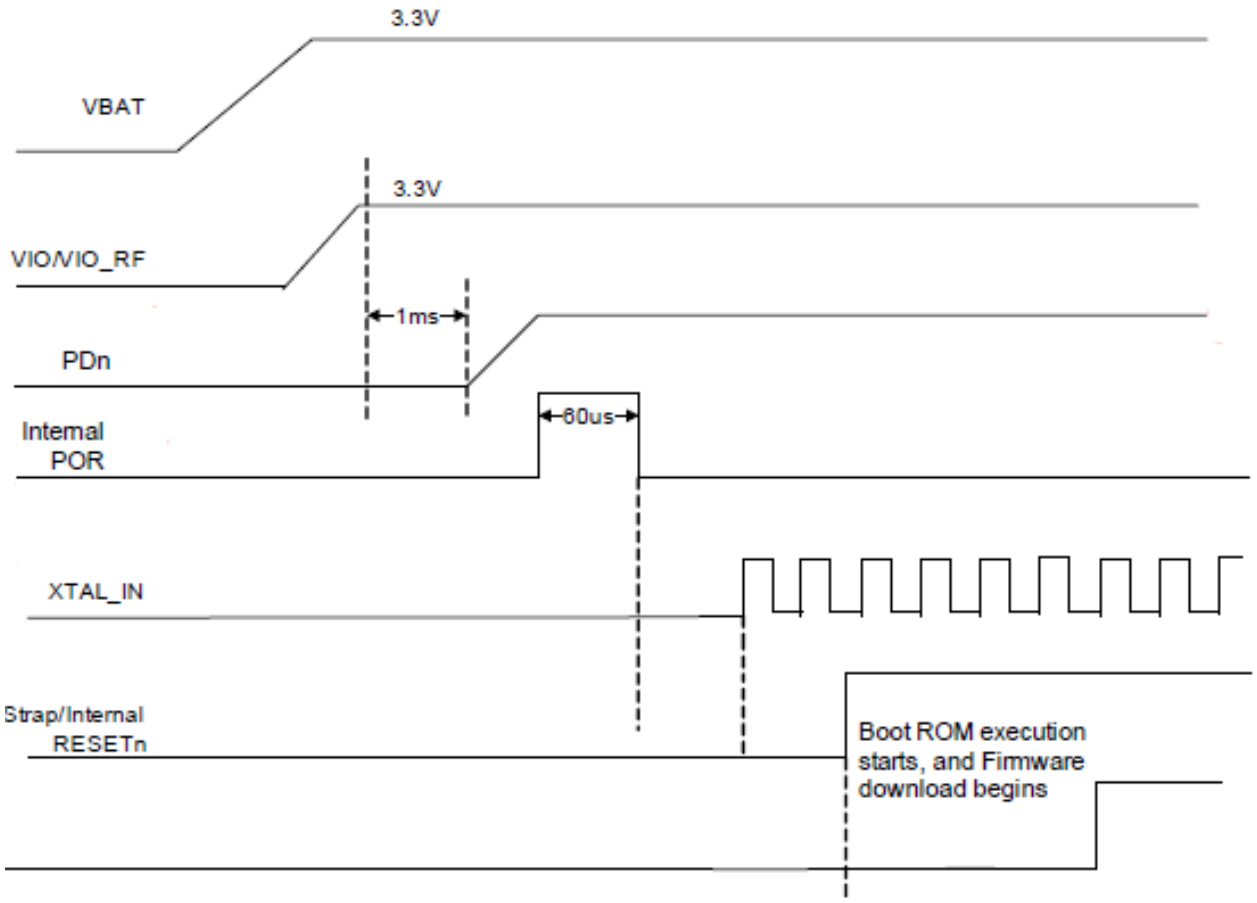
3.5 Power up Timing Sequence



3.5.1 Reset Configuration

The AW-CM276MA-SUR is reset to its default operating state under the following conditions:

- Power-on reset (POR)
- Software/Firmware reset
- External pin for power down (PDn)

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3.6 Power consumption

3.6.1 WLAN result

No.	Item	3.3V_VBAT=3.3V	
		Max.	Avg.
1.	Power down *(1)	0.61	0.59
2.	Deep sleep*(2) (Not enable usb_suspend.sh)	21.8	21.7
	Deep sleep *(2)(3)	2.6	2.6
3.	PS Mode 2.4g band *(3)(4)	96.0	7.2
4.	PS Mode 5g band *(3)(4)	163.7	8.3

No.	Item			3.3V_VBAT=3.3V				
				Transmit			Receive	
Band (GHz)	Mode	BW (MHz)	RF Power (dBm)	Max.	Avg.	DUTY %	Max.	Avg.
2.4	11b@1M	20	17	421.1	417.5	99	116.6	115.3
	11g@6M	20	16	380.5	377.4	99	118.4	117.8
	11n@MCS8 MIMO	20	16	729.3	721.5	98	141.1	140.8
	11n@MCS15 MIMO	20	16	652.1	647.1	78	139.2	139.0
	11n@MCS8 MIMO	40	14	602.4	597.6	89	159.2	158.9
	11n@MCS15 MIMO	40	14	520.4	516.6	70	153.6	153.5
5	11a@6M	20	13	402.2	401.3	98	141.9	139.2
	11n@MCS8 MIMO	20	13	794.5	791.2	95	174.3	174.2
	11n@MCS8 MIMO	40	12	737.9	734.6	88	201.5	201.3
	11ac@MCS0 NSS2	20	13	789.9	784.3	95	175.2	175.2
	11ac@MCS0 NSS2	80	10	656.2	654.7	86	216.3	214.3
	11ac@MCS9 NSS2	80	10	578.2	577.8	76	212.7	210.6

*Current Unit: mA

Note: DUT set Tx with Adjust Packet Gap with Sifs. Ext: Enter option: 35 1 1

(1) J14 power down pull low.

(2) The deep sleep current is too high, we using NXP reference board to measuring is same and highlighted to NXP this.

(3) Put the usb_suspend.sh file into the same folder with mlan.ko and run ./usb_suspend.sh 1

(4) Associate AP RT-AC66U, DTIM=1, Beacon Interval=100ms

3.6.2 BT result

No.	Mode	3.3V_VBAT=3.3V	
		Max.	Avg.
1	Connect BT device	35.7	21.4
2	A2DP (send audio)	47.9	29.8

*Current Unit: mA

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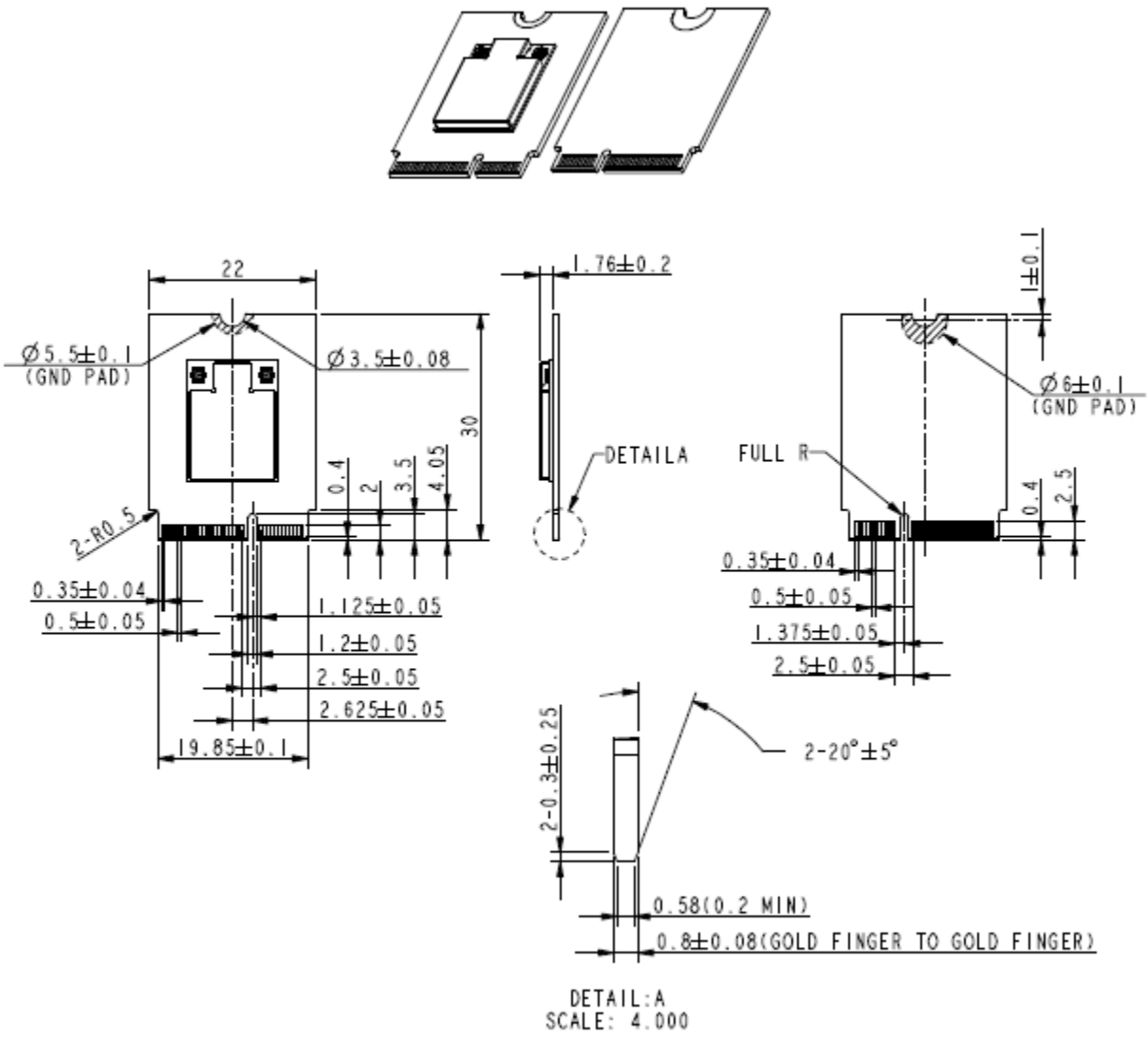
4. Mechanical Information

4.1 Mechanical Drawing



TOLERANCES UNLESS OTHERWISE SPECIFIED:±0.15mm

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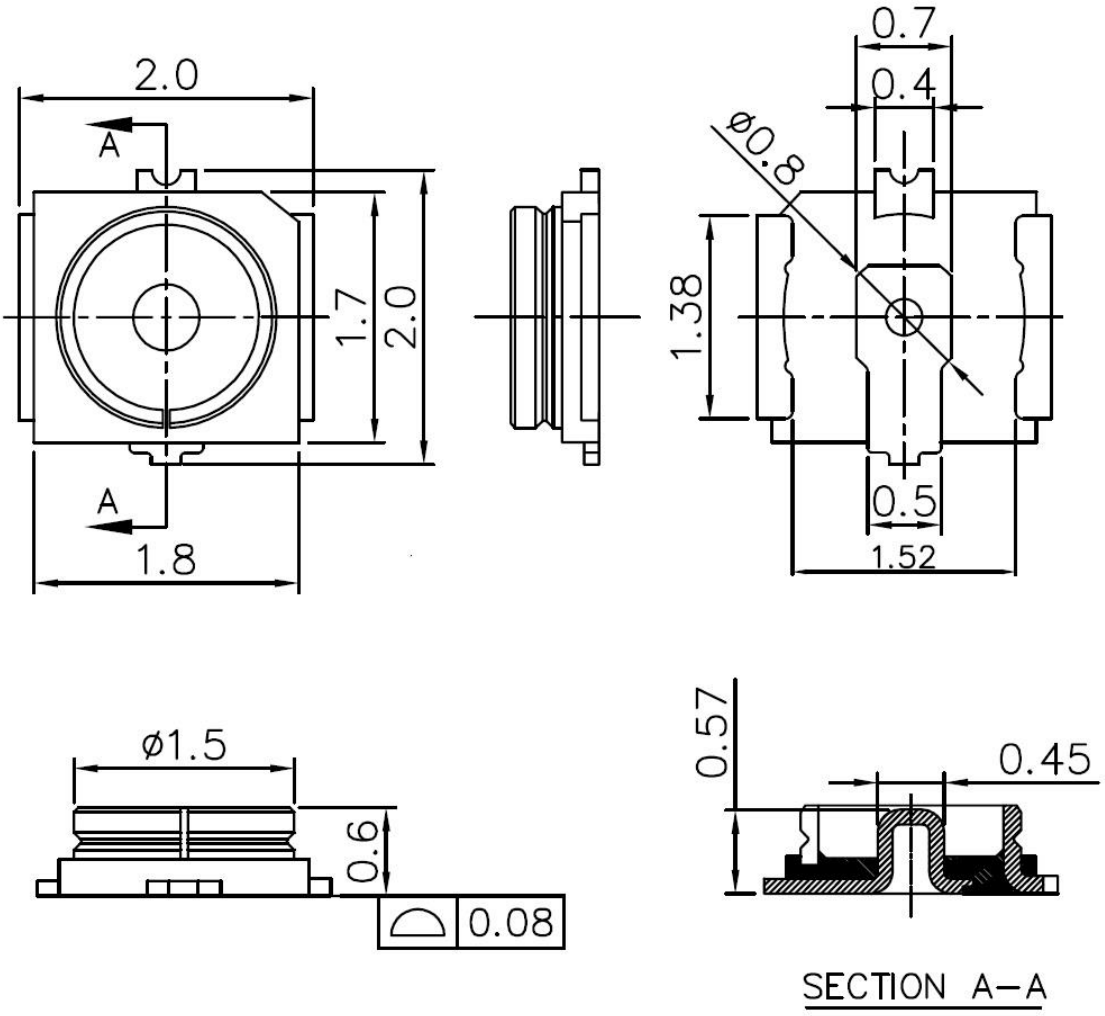
4.2 Antenna connector drawing



UNITS: mm

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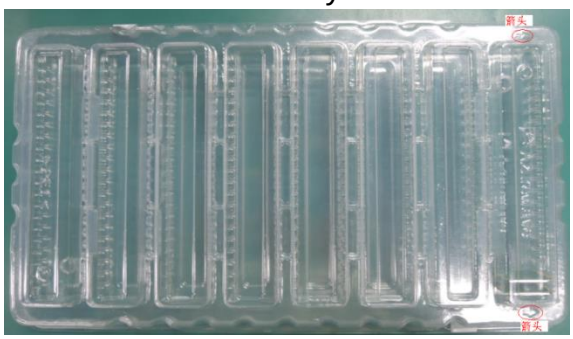
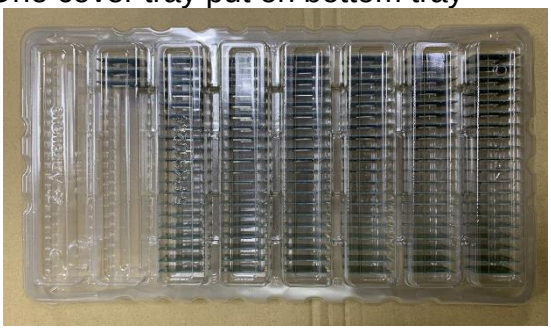
5. Packaging Information

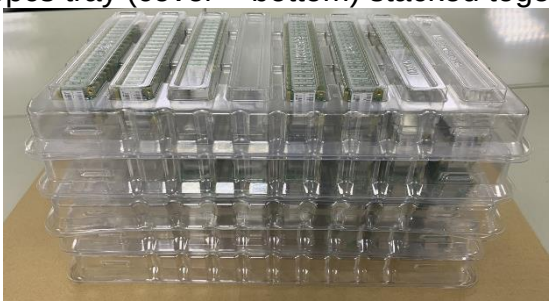
1. 160pcs M.2 2230 modules put in the one bottom tray



2. One cover tray put on bottom tray



3. 5pcs tray (cover + bottom) stacked together



4. Use P.P Strap to pack 5 trays

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5. Put packed trays into inner box

6. Seal the inner box by AzureWave tape

7. One package label pasted in side of inner box

Example:

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8. Two inner boxes put into one carton; If only one inner box has modules, “Empty” label pasted on the other one inner box

Example:

9. Seal the carton by AzureWave tape

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10. One carton label and box label pasted on the carton. If the carton is not full, one balance label pasted on the carton

Example of carton label	AzureWave P/N: Customer: 由業務提供 Customer P/N: 由業務提供 Customer PO: 由業務提供 Description: AW-XXXXXX QTY: 1200 pcs C/N: N.W.: G.W. RoHS COMPLIANT
Example of box label	
Example of production label	
Example of balance label	

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